第二章：开始学习 C++

```
//ex2.1--display your name and address
#include<iostream>
int main(void)
{
   using namespace std;
    cout<<"My name is liao chunguang and I live in hunan chenzhou.\
n”;
}
//ex2.2--convert the furlong units to yard uints-把浪单位换位码单位
#include<iostream>
double fur2yd(double);
int main()
{
   using namespace std;
   cout<<"enter the distance measured by furlong units:";
   double fur;
   cin>>fur;
   cout<<"convert the furlong to yard"<<endl;
    double yd;
   yd=fur2yd(fur);
   cout<<fur<<" furlong is "<<yd<<" yard"<<endl;
   return 0;
}
double fur2yd(double t)
{
   return 220*t;
}
//ex2.3-每个函数都被调用两次
#include<iostream>
void mice();
void see();
using namespace std;
int main()
{
```

```
    mice();
    mice();
    see();
    see();
    return 0;
}
void mice()
{
    cout<<"three blind mice"<<endl;
}
void see()
{
    cout<<"see how they run"<<endl;

}
//ex2.4
#include<iostream>
int main()
{
using namespace std;
cout<<"Enter your age:";
int age;
cin>>age;
int month;
month=age*12;
cout<<age<<" years is "<<month<<" months"<<endl;
return 0;
}
//ex2.5---convert the Celsius valve to Fahrenheit value
#include<iostream>
double C2F(double);
int main()
{
using namespace std;
cout<<"please enter a Celsius value:";
```

```
double C;
cin>>C;
double F;
F=C2F(C);
cout<<C<<" degrees Celsius is "<<F<<" degrees Fahrenheit."<<endl;
return 0;
}
double C2F(double t)
{
return 1.8*t+32;
}
//ex2.6---convert the light years valve to astronomical units--把光年转换为天文单位
#include<iostream>
double convert(double);//函数原型
int main()
{
using namespace std;
cout<<"Enter the number of light years:";
double light_years;
cin>>light_years;
double astro_units;
astro_units=convert(light_years);
cout<<light_years<<" light_years = "<<astro_units<<" astronomical units."<<endl;
return 0;
}
double  convert(double t)
{
return 63240*t;//1 光年=63240 天文单位
}
//ex2.7--显示用户输入的小时数和分钟数
#include<iostream>
void show();
```

```
main()
{
using namespace std;
show();
return 0;
}
void show()
{
using namespace std;
int h,m;
cout<<"enter the number of hours:";
cin>>h;
cout<<"enter the number of minutes:";
cin>>m;
cout<<"Time:"<<h<<":"<<m<<endl;
}
```

第三章：处理数据

```
//ex3.1—将身高用英尺(feet)和英寸(inch)表示
#include<iostream>
const int inch_per_feet=12;//  const 常量--1feet=12inches--1 英尺=12 英寸
int main()
{
   using namespace std;
   cout<<"please enter your height in inches:___\b\b\b";//  \b 表示为退格字符
   int ht_inch;
   cin>>ht_inch;
   int ht_feet=ht_inch/inch_per_feet;//取商
   int rm_inch=ht_inch%inch_per_feet;//取余
   cout<<"your height is "<<ht_feet<<" feet,and "
      <<rm_inch<<" inches\n";
   return 0;
}
//ex3.2--计算相应的 body mass index（体重指数）
#include<iostream>
const int inch_per_feet=12;
```

```
const double meter_per_inch=0.0254;
const double pound_per_kilogram=2.2;
int main()
{
   using namespace std;
   cout<<"Please enter your height:"<<endl;
   cout<<"First,enter your height of feet part（输入你身高的英尺部分）:_\b";
   int ht_feet;
   cin>>ht_feet;
   cout<<"Second,enter your height of inch part（输入你身高的英寸部分）:_\b";
   int ht_inch;
   cin>>ht_inch;
   cout<<"Now,please enter your weight in pound:___\b\b\b";
   double wt_pound;
   cin>>wt_pound;
   int inch;
   inch=ht_feet*inch_per_feet+ht_inch;
   double ht_meter;
   ht_meter=inch*meter_per_inch;
   double wt_kilogram;
   wt_kilogram=wt_pound/pound_per_kilogram;
   cout<<endl;
   cout<<"Your pensonal body information as follows:"<<endl;
    cout<<" 身高 :"<<inch<<"( 英尺 inch)\n"<<" 身高 :"<<ht_meter<<"( 米
meter)\n"
      <<"体重:"<<wt_kilogram<<"(千克 kilogram)\n";
   double BMI;
   BMI=wt_kilogram/(ht_meter*ht_meter);
   cout<<"your Body Mass Index(体重指数) is "<<BMI<<endl;
   return 0;
}
//ex3.3 以度，分，秒输入，以度输出
#include<iostream>
const int minutes_per_degree=60;
const int seconds_per_minute=60;
```

```
int main()
{
   using namespace std;
   cout<<"Enter a latitude in degrees,minutes,and seconds:\n";
   cout<<"First,enter the degrees:";
   int degree;
   cin>>degree;
   cout<<"Next,enter the minutes of arc:";
   int minute;
   cin>>minute;
   cout<<"Fianlly,enter the seconds of arc:";
   int second;
   cin>>second;
   double show_in_degree;

show_in_degree=(double)degree+(double)minute/minutes_per_degree
+(double)second/minutes_per_degree/seconds_per_minute;
                        cout<<degree<<"          degrees,"<<minute<<"
minutes,"<<second<<"seconds ="<<show_in_degree<<" degrees\n";
   return 0;
}
//ex3.4
#include<iostream>
const int hours_per_day=24;
const int minutes_per_hour=60;
const int seconds_per_minute=60;
int main()
{
   using namespace std;
   cout<<"Enter the number of seconds:";
   long seconds;
   cin>>seconds;
   int Day,Hour,Minute,Second;

Day=seconds/seconds_per_minute/minutes_per_hour/hours_per_day;
```

```
                    Hour=seconds/seconds_per_minute/minutes_per_hour
%hours_per_day;
   Minute=seconds/seconds_per_minute%minutes_per_hour;
   Second=seconds%seconds_per_minute;
      cout<<seconds<<"seconds = "<<Day<<" days,"<<Hour<<"
hours,"<<Minute<<" minutes,"<<Second<<" seconds\n";
   return 0;
}
//ex3.5
#include<iostream>
int main()
{
using namespace std;
cout<<"Enter the world population:";
long long world_population;
cin>>world_population;
cout<<"Enter the population of the US:";
long long US_population;
cin>>US_population;
double percentage;
percentage=(double)US_population/world_population*100;
cout<<"The population of the US is "<<percentage<<"% of the world
population.\n";
return 0;
}
//ex3.6      □ □ □ □ □ - □ □ (mpg)or □ □ □ □ (L/100Km)
#include<iostream>
int                                                    main()
{
 using                    namespace                        std;
 cout<<"Enter the miles of distance you have driven:";
 double                                              m_distance;
 cin>>m_distance;
 cout<<"Enter the gallons of gasoline you have used:";
 double                                              m_gasoline;
```

```
 cin>>m_gasoline;
 cout<<"Your car can run "<<m_distance/m_gasoline<<" miles per gallon\n";
 cout<<"Computing by European style:\n";
 cout<<"Enter the distance in kilometers:";
 double k_distance;
 cin>>k_distance;
 cout<<"Enter the petrol in liters:";
 double k_gasoline;
 cin>>k_gasoline;
 cout<<"In European style:"<<"your can used "<<100*k_gasoline/k_distance<<" liters of petrol per 100 kilometers\n";
 return 0;
}
//ex3.7  automobile gasoline consumption-□□□--□□□□(L/100Km)□□□□□□□(mpg)
#include<iostream>
int main()
{
   using namespace std;
   cout<<"Enter the automobile gasoline consumption figure in\n"
      <<"European style(liters per 100 kilometers):";
   double Euro_style;
   cin>>Euro_style;
   cout<<"Converts to U.S. style(miles per gallon):"<<endl;
    cout<<Euro_style<<" L/100Km = "<<62.14*3.875/Euro_style<<" mpg\n";
   return 0;
}
// Note that 100 kilometers is 62.14 miles, and 1 gallon is 3.875 liters.
//Thus, 19 mpg is about 12.4 L/100Km, and 27 mpg is about 8.7 L/100Km.
Enter the automobile gasoline consumption figure in
European style(liters per 100 kilometers):12.4
```

```
Converts to U.S. style(miles per gallon):
12.4 L/100Km = 19.4187 mpg
Press any key to continue
// ex3.7  automobile gasoline consumption-耗油量--美国风格(mpg)转换成欧洲风格(L/100Km)
#include<iostream>
int main()
{
   using namespace std;
   cout<<"Enter the automobile gasoline consumption figure in\n"
      <<"U.S. style(miles per gallon):";
   double US_style;
   cin>>US_style;
   cout<<"Converts to European style(miles per gallon):"<<endl;
   cout<<US_style<<" mpg = "<< 62.14*3.875/US_style<<"L/100Km\
n";
   return 0;
}
// Enter the automobile gasoline consumption figure in
U.S. style(miles per gallon):19
Converts to European style(miles per gallon):
19 mpg = 12.6733L/100Km
Press any key to continue
```

第四章 复合类型

```
//ex4.1 display the information of student
#include<iostream>
const int Asize=20;
using namespace std;
struct student//定义结构描述
{
   char firstname[Asize];
   char lastname[Asize];
   char grade;
   int age;
};
```

```
void display(student);//函数原型放在结构描述后
int main()
{

    cout<<"what is your first name?"<<endl;
    student lcg;//创建结构变量（结构数据对象）
    cin.getline(lcg.firstname,Asize);
    cout<<"what is your last name?"<<endl;
    cin.getline(lcg.lastname,Asize);
    cout<<"what letter grade do you deserve?"<<endl;
    cin>>lcg.grade;
    cout<<"what is your age?"<<endl;
    cin>>lcg.age;
    display(lcg);
    return 0;
}
void display(student name)
{

    cout<<"Name: "<<name.firstname<<","<<name.lastname<<endl;
    cout<<"Grade:"<<char(name.grade+1)<<endl;
    cout<<"Age:"<<name.age<<endl;
}
//ex4.2 use the string-class instead of char-array
#include<iostream>
#include<string>
int main()
{
    using namespace std;
    string name,dessert;
    cout<<"Enter your name: \n";
    getline(cin,name);

    cout<<"Enter your favorite dessert: \n";
    getline(cin,dessert);
```

```
    cout<<"I have some delicious "<<dessert;
    cout<<" for you, "<<name<<".\n";
    return 0;
}
//有时候会遇到需要按下两次回车键才能正确的显示结果，这是 vc++6.0 的一个 BUG，更改如下：else if (_Tr::eq((_E)_C, _D))
                {_Chg = true;
               _I.rdbuf()->sbumpc();//修改后的
                break; }
```

ex4.3 输入其名和姓，并组合显示

```
#include<iostream>
#include<cstring>
const int Asize=20;
int main()
{
    using namespace std;
    char fname[Asize];
    char lname[Asize];
    char fullname[2*Asize+1];
    cout<<"Enter your first name:";//输入名字，存储在 fname[]数组中
    cin.getline(fname,Asize);
    cout<<"Enter your last name:";//输入姓，存储在 lname[]数组中
    cin.getline(lname,Asize);
    strncpy(fullname,lname,Asize);//把姓 lname 复制到 fullname 空数组中
    strcat(fullname,", ");//把“， ”附加到上述 fullname 尾部
    strncat(fullname,fname,Asize);//把 fname 名字附加到上述 fullname 尾部
    fullname[2*Asize]='\0';//为防止字符型数组溢出，在数组结尾添加结束符
                cout<<"Here's the information in a single string:"<<fullname<<endl;//显示组合结果
    return 0;
}
```

//ex4.4 使用 string 对象 存储、显示组合结果

```
#include<iostream>
#include<string>
```

```
int main()
{
    using namespace std;
    string fname,lname,attach,fullname;
    cout<<"Enter your first name:";
    getline(cin,fname);//note:将一行输入读取到 string 类对象中使用的是 getline(cin,str)
                        //它没有使用句点表示法，所以不是类方法
    cout<<"Enter your last name:";
    getline(cin,lname);
    attach=", ";
    fullname=lname+attach+fname;
            cout<<"Here's the information in a single
string:"<<fullname<<endl;
    return 0;
}
//ex4.5 declare a struct and initialize it 声明结果并创建一个变量
#include<iostream>
const int Asize=20;
struct CandyBar
{
    char brand[Asize];
    double weight;
    int calory;
};
int main()
{
    using namespace std;
    CandyBar snack={"Mocha Munch",2.3,350};
    cout<<"Here's the information of snack:\n";
    cout<<"brand:"<<snack.brand<<endl;
    cout<<"weight:"<<snack.weight<<endl;
    cout<<"calory:"<<snack.calory<<endl;
    return 0;
}
//ex4.6 结构数组的声明及初始化
```

```
#include<iostream>
const int Asize=20;
struct CandyBar
{
    char brand[Asize];
    double weight;
    int calory;
};
int main()
{
    using namespace std;
    CandyBar snack[3]={
        {"Mocha Munch",2.3,350},
        {"XuFuJi",1.1,300},
        {"Alps",0.4,100}
    };
for(int i=0;i<3;i++)//利用 for 循环来显示 snack 变量的内容
    {
        cout<<snack[i].brand<<endl
            <<snack[i].weight<<endl
            <<snack[i].calory<<endl<<endl;
    }
    return 0;
}
//ex4.7 pizza 披萨饼
#include<iostream>
#include<string>
const int Size=20;
struct pizza//声明结构
{
    char company[Size];
    double diameter;
    double weight;
};
int main()
```

```
{
    using namespace std;
    pizza pie;//创建一个名为 pie 的结构变量
    cout<<"What's the  name of pizza company:";
    cin.getline(pie.company,Size);
    cout<<"What's the diameter of pizza:";
    cin>>pie.diameter;
    cout<<"What's  the weight of pizza:";
    cin>>pie.weight;
    cout<<"company:"<<pie.company<<endl;
    cout<<"diameter:"<<pie.diameter<<"inches"<<endl;
    cout<<"weight:"<<pie.weight<<"ounches"<<endl;
    return 0;
}
//ex4.8 pizza pie 披萨饼 使用 new 创建动态结构
#include<iostream>
#include<string>
const int Size=20;
struct pizza//声明结构
{
    char company[Size];
    double diameter;
    double weight;
};
int main()
{
    using namespace std;
    pizza *pie=new pizza;//使用 new 创建动态结构
    cout<<"What's the diameter of pizza:";
    cin>>pie->diameter;
    cin.get();//读取下一个字符
    cout<<"What's the  name of pizza company:";
    cin.get(pie->company,Size);
    cout<<"What's  the weight of pizza:";
    cin>>pie->weight;
```

```
    cout<<"diameter:"<<pie->diameter<<" inches"<<endl;
    cout<<"company:"<<pie->company<<endl;
    cout<<"weight:"<<pie->weight<<" ounches"<<endl;
    delete pie;//delete 释放内存
    return 0;
}
//ex.4.9 使用 new 动态分配数组—方法 1
#include<iostream>
#include<string>
using namespace std;
struct CandyBar
{
    string brand;
    double  weight;
    int calory;
};
int main()
{

    CandyBar *snack= new CandyBar[3];
    snack[0].brand="A";//单个初始化由 new 动态分配的内存
    snack[0].weight=1.1;
    snack[0].calory=200;
    snack[1].brand="B";
    snack[1].weight=2.2;
    snack[1].calory=400;
    snack[2].brand="C";
    snack[2].weight=4.4;
    snack[2].calory=500;
for(int i=0;i<3;i++)
    {
    cout << " brand: " << snack[i].brand << endl;
    cout << " weight: " << snack[i].weight << endl;
    cout << " calorie: " << snack[i].calory << endl<<endl;
    }
```

```
delete [] snack;
return 0;
}
//ex.4.10 □□—□□ 1
#include <iostream>
int main()
{
    using namespace std;
    const int Size = 3;
    int success[Size];
     cout<<"Enter your success of the three times 40 meters running:\
n";
    cin >> success[0]>>success[1]>>success[2];
    cout<<"success1:"<<success[0]<<endl;
    cout<<"success2:"<<success[1]<<endl;
    cout<<"success3:"<<success[2]<<endl;
    double average=(success[0]+success[1]+success[2])/3;
    cout<<"average:"<<average<<endl;
    return 0;
}
//ex.4.10 array—□□ 2
#include <iostream>
#include <array>
int main()
{
    using namespace std;
    array<double,4>ad={0};
     cout<<"Enter your success of the three times 40 meters running:\
n";
    cin >> ad[0]>>ad[1]>>ad[2];
    cout<<"success1:"<<ad[0]<<endl;
    cout<<"success2:"<<ad[1]<<endl;
    cout<<"success3:"<<ad[2]<<endl;
    ad[3]=(ad[0]+ad[1]+ad[2])/3;
    cout<<"average:"<<ad[3]<<endl;
```

```
    return 0;
}
```

□□□ □□□□□□□□

```
//ex.5.1
#include <iostream>
int main()
{
    using namespace std;
    cout<<"Please enter two integers: ";
    int num1,num2;
    cin>>num1>>num2;
    int sum=0;
    for(int temp=num1;temp<=num2;++temp)//or temp++
    sum+=temp;
        cout<<"The sum from "<<num1<<" to "<<num2<<" is
"<<sum<<endl;
    return 0;
}
//ex.5.2
#include <iostream>
#include<array>
int main()
{
    using namespace std;
    array<long double,101>ad={0};
    ad[1]=ad[0]=1L;
    for(int i=2;i<101;i++)
        ad[i]=i*ad[i-1];
    for(int i=0;i<101;i++)
        cout<<i<<"! = "<<ad[i]<<endl;
    return 0;
}
//ex.5.3
#include <iostream>
int main()
```

```
{
   using namespace std;
   cout<<"Please enter an integer: ";
   int sum=0,num;
   while((cin>>num)&&num!=0)
   {
      sum+=num;
      cout<<"So far, the sum is "<<sum<<endl;
      cout<<"Please enter an integer: ";
   }
   return 0;
}
//ex.5.4
#include <iostream>
int main()
{
   using namespace std;
   double sum1,sum2;
   sum1=sum2=0.0;
   int year=0;
   while(sum2<=sum1)
   {
      ++year;
      sum1+=10;
      sum2=(100+sum2)*0.05+sum2;
   }
   cout<<"□□"<<year<<"□□□Cleo □□□□□□□□□ Daphne □□□□□□"<<endl;
     cout<<" □ □ □ Cleo □ □ □ □ □ □ "<<sum1<<" □ □ Daphne □ □ □ □ □
□"<<sum2<<endl;
   return 0;
}
//ex.5.5
#include <iostream>
const int MONTHS = 12;
```

```
const                                                                    char*
months[MONTHS]={"January","February","March","April","May","June",
"July","August","September","October","November","December"};
int main()
{
   using namespace std;
   int sales[MONTHS],sum=0;
   for(int i=0;i<MONTHS;i++)
   {
     cout<<"请输入在"<<months[i]<<"的 C++ For Fools 的销售量: ";
     cin>>sales[i];
     sum+=sales[i];
   }
   cout<<"这一年中的 C++ For Fools 的总销售量为: "<<sum<<endl;
   return 0;
}
//ex.5.6
#include <iostream>
const int MONTHS = 12;
const                                                                    char*
months[MONTHS]={"January","February","March","April","May","June",
"July","August","September","October","November","December"};
const char* years[3]={"第一年","第二年","第三年"};
int main()
{
   using namespace std;
   int year_sale[3],sum=0,sales[3][MONTHS];
   for(int i=0;i<3;i++)
   {
         int temp=0;
         cout<<years[i]<<"的每个月销售量:"<<endl;
         for(int j=0;j<MONTHS;j++)
         {
               cout<<"请输入"<<months[j]<<"的销售量:";
               cin>>sales[i][j];
```

```
                temp+=sales[i][j];
            }
            year_sale[i]=temp;
            sum+=year_sale[i];
    }
    for(int i=0;i<3;i++)
    cout<<years[i]<<"的销售量为: "<<year_sale[i]<<endl;
    cout<<"这三年的总销售量为: "<<sum<<endl;
    return 0;
}

//ex.5.7
#include <iostream>
#include <string>
using namespace std;
struct car{
     string name;
     int year;
};
int main()
{
    cout<<"How many cars do you wish to catalog? ";
    int num;
    (cin>>num).get();
    car* ps=new car[num];
    for(int i=0;i<num;++i)
    {
            cout<<"Car #"<<i+1<<":\n";
            cout<<"Please enter the make: ";
            getline(cin,ps[i].name);
            cout<<"Please enter the year made: ";
            (cin>>ps[i].year).get();
    }
    cout<<"Here is your collection:\n";
    for(int i=0;i<num;++i)
```

```
    cout<<ps[i].year<<" "<<ps[i].name<<endl;
    delete [] ps;
    return 0;
}

//ex.5.8
#include <iostream>
#include <cstring>
int main()
{
    using namespace std;

    char word[20];
    int sum=0;
    cout<<"Enter words (to stop,type the word done):\n";
    cin>>word;
    while(strcmp(word,"done"))
    {
        sum++;
        cin>>word;
    }
    cout<<"You entered a total of "<<sum<<" words.\n";
    return 0;
}
//ex.5.9
#include <iostream>
#include <string>
int main()
{
    using namespace std;
    string word;
    int sum=0;
    cout<<"Enter words (to stop, type the word done):\n";
    cin>>word;
    while(word!="done")
```

```
    {
        sum++;
        cin>>word;
    }
    cout<<"You entered a total of "<<sum<<" words.\n";
    return 0;
}
//ex.5.10
#include <iostream>
int main()
{
    using namespace std;
    cout<<"Enter number of rows:";
    int num;
    cin>>num;
    for(int i=0;i<num;i++)
    {
        for(int j=num-i;j>1;j--)
        cout<<".";
        for(int k=0;k<=i;++k)
            cout<<"*";
            cout<<endl;
    }
    return 0;
}
□□□□□□□□□□□□□□□□□
```